

The density of a 1 m x 1 m square column of seawater is approximated by $\rho(x) = \rho_0 + f\sqrt{x/D}$ where x is the depth, $\rho_0 = 1025 \text{ kg/m}^3$ is the density at the surface, $f = .003 \text{ kg/m}^3$, $D=1000 \text{ m}$ is the depth of the water (see graph at <http://www.windows2universe.org/earth/Water/density.html>). a) What is the mass of the water column to the nearest kg? b) Where is the center of mass?